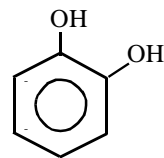


CATECHOL

Catechol is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 120-80-9

Molecular Formula: $C_6H_6O_2$



Catechol is a colorless crystal with a phenolic odor (HSDB, 1993). It easily sublimates and can react with oxidizing materials. Catechol is soluble in water, alcohol, carbon tetrachloride, hot benzene, chloroform, and ether. It is slightly soluble in cold benzene and very soluble in pyridine and aqueous alkalis (Merck 1989).

Physical Properties of Catechol

Synonyms: Catechin; pyrocatechol; pyrocatechin; 1,2-benzenediol; o-dihydroxybenzene

Molecular Weight:	110.11
Boiling Point:	245.5 °C
Melting Point:	105 °C
Flash Point:	261 °F (closed cup)
Vapor Density:	3.79 (air = 1)
Density/Specific Gravity:	1.341 at 15/4 °C(water=1)
Vapor Pressure:	0.03 mm Hg at 20 °C
Log Octanol/Water Partition Coefficient:	0.88
Conversion Factor:	1 ppm = 4.5 mg/m ³

(HSDB, 1993; Merck, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

Catechol is used as a starting material in the synthesis of polymerization, inhibitors, antioxidants, pharmaceuticals, pesticides, and in photography and photosensitive copying papers. Catechol has been detected in coal conversion wastewaters, crude wood tar, drainage water from bituminous shale, the outflow from coal-tar chemical production, and in cigarette smoke (HSDB, 1993).

The primary source of catechol emissions in California reported in the United States Environmental Protection Agency's (U.S. EPA) 1995 Toxics Release Inventory (TRI) Public Data Release Report were the chemical and allied products industries (U.S. EPA, 1996b).

B. Emissions

In California, 34 pounds of catechol emissions were reported in the U.S. EPA 1995 TRI Public Data Release Report (U.S. EPA, 1996b).

C. Natural Occurrence

Catechol is found in plants including onions and apples, and in crude beet sugar coal. It is also found in the leaves and branches of oak and willow trees (HSDB, 1993).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of catechol.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of catechol was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Catechol exists mainly in the vapor phase in the ambient atmosphere and will react with photochemically-produced hydroxyl radicals. The half-life from this reaction is estimated to be 0.3 days. Because of its solubility in water, catechol is expected to be readily removed from the atmosphere by rain (Atkinson, 1995). In nighttime air, catechol's reaction with nitrate radicals may be an important removal process (HSDB, 1993).

AB 2588 RISK ASSESSMENT INFORMATION

Catechol emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to catechol are inhalation and dermal contact (Sittig, 1991).

Non-Cancer: Catechol causes methemoglobinemia. Systemic toxicity is similar to that of phenol; however, catechol may be more likely to cause convulsions and hypertension. Direct contact is highly irritating to the eyes and skin (Sittig, 1991; U.S. EPA, 1994a). Acute exposures can cause skin burns, headaches, nausea, muscle twitching and convulsions. Catechol is a central nervous system depressant and increases blood pressure in animal studies.

The U.S. EPA has not established an oral Reference Dose (RfD) for catechol, and a Reference Concentration (RfC) is under review (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects in humans or animals (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of catechol in humans. Catechol increased the carcinogenic effects of benzo[a]pyrene on the skin in mice when applied together dermally. The U.S. EPA has not classified catechol (pyrocatechol) for carcinogenicity (IARC, 1987a). The International Agency for Research on Cancer has classified catechol in Group 3: Not classifiable as to its carcinogenicity (U.S. EPA, 1994a).

